

## **ABSTRACT OF THE DISCLOSURE**

A method for removing from a microelectronic device structure a noble metal residue including at least one metal selected from the group consisting of platinum, palladium, iridium and rhodium, by contacting the microelectronic device structure with a cleaning gas including a reactive halide composition, e.g., XeF<sub>2</sub>, SF<sub>6</sub>, SiF<sub>4</sub>, Si<sub>2</sub>F<sub>6</sub> or SiF<sub>3</sub> and SiF<sub>2</sub> radicals. The method may be carried out in a batch-cleaning mode, in which fresh charges of cleaning gas are successively introduced to a chamber containing the residue-bearing microelectronic device structure. Each charge is purged from the chamber after reaction with the residue, and the charging/purging is continued until the residue has been at least partially removed to a desired extent. Alternatively, the cleaning gas may be continuously flowed through the chamber containing the microelectronic device structure, until the noble metal residue has been sufficiently removed.